

WAA
W276r
1879

NATIONAL LIBRARY OF MEDICINE



NLM 00105870 4

Waring (Geo. E.) Jr.

REPORT



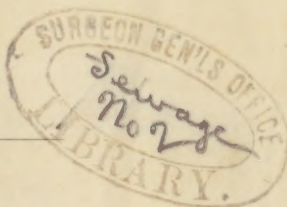
ON THE

Drainage of Williamstown

BY

✓
COL. GEO. E. WARING, JR.,

SANITARY ENGINEER.



JAMES T. ROBINSON & SON,
Book and Job Printers and Blank Book Manufacturers,
North Adams, Mass.
1879.

WAA
W2765
1879

PUBLISHED BY THE
WILLIAMSTOWN VILLAGE IMPROVEMENT SOCIETY.

THE DRAINAGE OF WILLIAMSTOWN.

After a careful examination of the local conditions existing in Williamstown, for which examination I was employed by Cyrus W. Field, Esq., I submit the following report concerning the means available for disposing of household wastes and, so far as the western end of the main street is concerned, of the soil water which now makes that part of the village unduly wet.

It would be possible to collect the entire drainage of the village into sewers constituting a single system and to deliver it through a main outlet sewer into the Hoosac River.

The cost of such an operation, however, would be, in view of the small population, the wide separation of the houses, and the distance to the point of outlet, too expensive to be recommended.

It seems to me that the whole village, except the Water street district, is peculiarly well situated for the disposal of its sewage, by what is known as sub-irrigation, in an inexpensive and complete manner.

The Water street district can best be drained by a main sewer of six inch vitrified pipe, leading from the neighborhood of Professor Dodd's house, through the course of Water street to a point of discharge at Green river, where it receives the water of the brook leading from Christmas Pond. Properly constructed and efficiently flushed, there would, in my opinion, be no objec-

tion to the delivery of this sewage directly into the deep water of Green river at this point, but to make it still less objectionable, it would be well to carry a portion of the out-flow of Christmas pond into a main sewer at a point somewhat above its outlet, so as to secure a still more complete and thorough dilution and distribution of the sewage matters. A branch of this sewer running through New street to about its intersection with the street west of and parallel to Water street, would furnish a satisfactory outlet for the sewage of that whole region. It is clearly better to treat this section of the village in this manner, than to adopt the system of sub-irrigation, there being no available land for this. Should the future increase of population add so materially to the amount of sewage discharge here as to create a nuisance in the pond between Water street and the North Adams road, the remedy would be to continue the sewer to a point below the dam of this pond. There is no reasonable probability of such an increase of population in this section as to make a larger pipe than six inch necessary. It is not contemplated that this system of sewers shall receive any surface water; only the foul wastes from the houses of the district. It should also have a Field's flush tank at its upper end, with a capacity of about five barrels, fed by a stream from the water service sufficient to fill it once in twenty-four hours. All house drains connected with this sewer should be constructed and connected according to proper regulations provided and enforced by the village authorities.

The short street running south from the Post Office is so closely built up that its houses may best be served by a sewer running under the street, which sewer would suffice also for the drainage of the houses between this street and the college buildings.

The sewage of this district may be perfectly disposed of on the land lying south of Mr. Hunt's house and between that and the open ditch leading from the spring to Christmas pond.

Should it be impracticable to obtain possession of this ground for such use, this sewer might be connected with the Water street system by a drain laid through the college grounds and past the side of Christmas pond and its outlet. In either case the sewer of this street should be of six inch vitrified pipe, the use of a smaller pipe for this purpose being nowhere advisable. Like the Water street sewer, it should have a flush tank at its upper end.

That part of the main street lying between the college buildings and North and South streets may be treated in two sections; one discharging its drainage to the north and one to the south. In both cases, assuming that the right of way for the lines of drains can be secured, the best and most economical plan would be to carry these from the rear of the houses.

The system on the north side may include the buildings on Park street as far as the road leading to the west, opposite Dr. Hopkins' house. It may also properly include the Mansion house and its stables and the houses on the west side of North street. All of these subsidiary drains may be brought together into a flush tank of one thousand gallons capacity at the upper edge of the field which constitutes the north-west portion of this block. The discharge of this flush tank may be delivered into absorption drains placed in this field and having a combined length of one thousand feet. The efficiency of this system will in this case be increased if the field in question is reasonably well under-drained.

Such under-drainage and the fertilizing effect of the discharge of sewage would add very materially to the agricultural value of the land.

The houses on the south side of the main street between the West college and South street, together with the houses on the east side of South street, may deliver their drainage in like manner into a flush tank of 500 gallons capacity, discharging into absorption drains, measuring in the aggregate 500 feet. The loca-

tion of the flush tank and absorption drains would, of course, have to be a matter of agreement among the different owners.

A number of the houses on the north side of the Main street between the college buildings and Depot street might unite and dispose of their sewage by the same sort of combination. There are a few other points where two or more houses might combine in like manner, but as a rule, throughout the whole village, except in the instances cited above, it will be more economical, more simple and equally advantageous, if the wastes of each house are disposed of within its own grounds by the application on a still smaller scale of the same system of sub-surface irrigation.

I have no hesitation in recommending such an application of this system of disposal for the conditions existing in every part of the village outside of the Water street district. It will be much cheaper than any possible method of distant removal and it has been shown by experience to be absolutely free from objection.

This system is described on page 334 of the 7th Annual Report of the State Board of Health for Massachusetts, and on page 135 of the 8th Annual Report of the same Board. In a circular issued in April, 1879, the Board of Health makes a most unqualified recommendation of this method of distribution, saying "if water closets are used and there are no sewers, the best disposal of the sewage is by the flush tank and irrigation under the surface of the soil."

It is an essential condition of the successful application of this system that a flush tank be interposed between the source of the sewage and the drains intended for its final disposal so that these drains and the lands containing them may be subjected during the greater part of the time to the oxidizing influences of a drained and aerated soil. To depend upon this system, with a constant flow, keeping a much smaller area of land constantly saturated with the foul drip—defeats the purpose and entails serious

sanitary difficulties, similar to those resulting from the discharge of house drains directly on to the surface of the ground, now so common in the village. Where several houses are connected with the same system, one flush tank will answer a good purpose, but where each house has its own system, each must have its own flush tank. In either case it is most desirable to interpose a grease trap in the course of the drain, as near as possible to the kitchen sink, so that grease, which would otherwise congeal in the pipes and inevitably choke them, may be held back in the trap and removed if, and when necessary.

A description of the methods for applying this system will be found on pages 79 to 81 and 94 to 105 of my book entitled "Village Improvements and Farm Villages," a copy of which accompanies this report. Ample experience since these pages were written has shown that the possibility of interruption by frost does not exist and that the system on the larger scale as well as on the smaller, is absolutely perfect and reliable. One modification has, however, been suggested by more recent experience. This is to place the grease trap between the house and the flush tank, instead of putting it between the flush tank and the absorption drains as therein directed, and this modification is an important one.

It would be impossible, without a much more minute study of the locality than I have been able to make, to give a reliable statement of the cost of the work above indicated, but it is safe to say that it would not be more than one-quarter of the cost of making a system of sewers discharging through a main outflow into the Hoosac river.

The sewerage by this system of the village of Lenox, the drainage of all the houses being carried to a single 5000 gallon flush tank half a mile distant, and its discharge being into 10,000 feet of absorption drains, together with the construction of man holes and all appliances and with engineering and superintendence, was less than \$10,000. Relatively to the population, the disposal

Cost

in detail as made necessary in Williamstown by the irregularity of the ground would cost materially less.

The present annoying condition of the western end of Main street, especially in the spring of the year, is due entirely to the over saturation of the heavy clay soil prevailing there. This may be cheaply and simply remedied by a well arranged system of agricultural under-drainage, the outflow being carried, quite independently of the foul drainage system, into the valley north of the Mansion house stables. This subject is treated on pages 39 to 47 in "Village Improvements and Farm Villages."

Should further information concerning the work suggested be necessary, or should this report be found in any respect incomplete, I shall be glad to respond to an application for further explanation.

GEO. E. WARING, JR.

NEWPORT, R. I., May 21, 1879.

NATIONAL LIBRARY OF MEDICINE



NLM 00105870 4